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ART UNIT	**PAPER NUMBER**
2616	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/665,190	ZHAO, FUYONG	
	Examiner	Art Unit	
	Pao Sinkantarakorn	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 September 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *6* is/are allowed.

6)☒ Claim(s) *1-5 and 7-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-21 are currently pending in the application.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 10-13 are rejected under 35 U.S.C. 101 because the claimed inventions are directed to non-statutory subject matter.

Regarding claims 10-13, the claim recites "a computer-readable medium carrying one or more sequences of instructions...which instructions, when executed by one or more processors...", which is non-statutory descriptive material since it is not functional it cannot carry out the claimed invention, therefore it is not statutory subject matter.

NOTE: To overcome this rejection, it is suggested that the applicant rewrite claims 10-13 in terms of "a computer readable medium embodied with computer executable instructions for ..."

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-5 and 7-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Cain et al. (US 2003/0202468).

Regarding claims 1, 10, 14, and 18, Cain et al. disclose a method of discovering a network path that satisfies a quality of service (QOS) requirement, the method comprising computer-implemented steps of:

receiving, at a first router, a first data packet that indicates a destination and the QOS requirement (see paragraph 43, the source node transmits a QOS route request to discover paths to the destination node based upon a QOS parameter);

updating the first data packet to indicate an identity of the first router (see paragraph 44, the intermediate node updates the QOS link metric and temporarily reserves node resources for that QOS route request);

determining whether a least-delay path from the first router to the destination satisfies the QOS requirement (see paragraphs 44 and 70-72, each intermediate node determines whether the node can support the requested QOS parameter of the QOS route request; the source node may receive multiple QOS route requests for paths to the destination node that can meet the required QOS; it will rank order these and send out a message indicating its selection of a path on the highest ranked path);

determining whether the first data packet has visited any router in the least-delay path other than the first router (see paragraphs 44, 45, 69, and 70, each intermediate

node is capable of determining whether the data packet has visited any router in the path by examining the QOS flow identifier and the QOS metric; a flow ID is assigned to the QOS route request to uniquely identify the flow to any node in the network);

if the least-delay path satisfies the QOS requirement and the first data packet has not visited any router in the least-delay path other than the first router, then sending the first data packet to a second router in the least-delay path (see paragraphs 44, 45, 69, and 70, once the intermediate node 3 receives the QOS route request from the source node 1, it determines whether the node 3 can support the requested QOS parameter and whether the packet has visited any router in the path other than the intermediate node 3, then it forwards the packet to intermediate node 5; the intermediate node 5 does the same and forwards the packet to the destination node 4, 1-3-5-4); and

receiving, at the first router, a second data packet that indicates a path taken the first data packet to the destination (see paragraph 45, the source node receives a reply QOS route request and generates QOS route metrics based upon updated QOS link metrics in reply QOS route request from the destination node);

regarding claims 2, 11, 15, and 19, the first router has links, and further comprising:

if the least-delay path does not satisfy the QOS requirement (see paragraphs 44 and 45, if an intermediate node cannot support the requested QOS parameter, it will deny the request while other intermediate nodes are processing the determining step), then performing steps comprising:

determining one or more of the first router's links that satisfy the QOS requirement (see paragraph 44 and 45, each intermediate node 2, 3, and 5 determine whether the node can support the requested QOS parameter); and

sending a copy of the first data packet through the one or more of the first router's link that satisfy the QOS requirement (see paragraphs 44 and 45, if the intermediate nodes can support the request QOS parameter, the nodes forward the packet to other intermediate nodes that are connected to it);

regarding claims 3, 12, 16, and 20, the first router has links, and further comprising:

if the first data packet has visited a router in the least-delay path other than the first router, then performing steps comprising:

determining one or more of the first router's links that satisfy the QOS requirement(see paragraph 44 and 45, each intermediate node 2, 3, and 5 determine whether the node can support the requested QOS parameter); and

sending a copy of the first data packet through the one or more of the first router's link that satisfy the QOS requirement (see paragraphs 44 and 45, if the intermediate nodes can support the request QOS parameter, the nodes forward the packet to other intermediate nodes that are connected to it);

regarding claims 4, 13, 17, and 21, in response to receiving the first data packet, updating a table to indicate that the first router has received a copy of the first data packet (see paragraph 44, updating the QOS link metric).

Regarding claim 5, Cain et al. disclose a method of discovering a network path that satisfies a quality of service (QOS) requirement, the method comprising computer-implemented steps of:

receiving, at a first router, a data packet that indicates a destination and the QOS requirement (see paragraph 43, the source node transmits a QOS route request to discover paths to the destination node based upon a QOS parameter);

determining whether the data packet indicates that a path to the destination has been found (see paragraphs 43-45, the reply QOS route request indicates that a path to the destination has been found);

determining whether a least-delay path from the first router to the destination satisfies the QOS requirement (see paragraphs 44 and 70-72, each intermediate node determines whether the node can support the requested QOS parameter of the QOS route request; the source node may receive multiple QOS route requests for paths to the destination node that can meet the required QOS; it will rank order these and send out a message indicating its selection of a path on the highest ranked path);

if the data packet indicates that a path to the destination has been found, and if the least-delay path from the first router to the destination does not satisfy the QOS requirement, then eliminating the data packet (see paragraph 44, if the node cannot support the QOS parameter, then the request is denied); and

if the data packet does not indicate that a path to the destination has been found, and if the least-delay path from the first router to the destination satisfies the QOS

requirement (see paragraphs 67-73, if a link fails, a route error packet is returned to the source node; and then the route discovery process is initiated again), then performing steps comprising:

updating the data packet to indicate that a path to the destination has been found (see paragraphs 68-72, the discovery process includes broadcasting a QOS route request to all the nodes and receiving, in return, a reply QOS route request, which indicates that a route has been discovered); and

sending the data packet through the link that leads to the second router on the least-delay path (see paragraphs 43-45 and 68-72, once the source node selects a path based on the highest ranked path, data packets then can be routed through the path via intermediate nodes; for example, source node – intermediate node 3 – intermediate node 4 – destination node).

Regarding claim 7, Cain et al. disclose a method of discovering a least-cost network path, the method comprising computer-implemented steps of:

receiving, at a first router, a first data packet that indicates a destination (see paragraph 43, the source node transmits a QOS route request to discover paths to the destination node based upon a QOS parameter);

updating the first data packet to indicate an identity of the first router (see paragraph 44, the intermediate node updates the QOS link metric and temporarily reserves node resources for that QOS route request);

determining whether the first data packet has visited any router in a least-cost path from the first router to the destination, not including the first router (see paragraphs 44, 45, 69, and 70, each intermediate node is capable of determining whether the data packet has visited any router in the path by examining the QOS flow identifier and the QOS metric; a flow ID is assigned to the QOS route request to uniquely identify the flow to any node in the network);

if the first data packet has not visited any router in the least-cost path other than the first router, then sending the first data packet to a second router in the least-cost path (see paragraphs 44, 45, 69, and 70, once the intermediate node 3 receives the QOS route request from the source node 1, it determines whether the intermediate node 3 can support the requested QOS parameter and whether the packet has visited any router in the path other than the intermediate node 3, wherein the QOS link metric indicates whether the packet has visited any other router by determining whether the QOS link metric has been updated, then it forwards the packet to other intermediate nodes 2 and 5; the intermediate nodes 2 and 5 do the same and forward the packet to the destination node 4; QOS parameter is preferably based upon available bandwidth, error rate, delay, etc.; therefore, 1-3-5-4 route can be least-cost path);

if the first data packet has visited a router in the least-cost path other than the first router, then sending the first data packet to a third router in a first least-delay path from the first router to the destination (see paragraphs 44, 45, 69, and 70, once the intermediate node 3 receives the QOS route request from the source node 1, it determines whether the intermediate node 3 can support the requested QOS parameter

and whether the packet has visited any router in the path other than the intermediate node 3, wherein the QOS link metric indicates whether the packet has visited any other router by determining whether the QOS link metric has been updated, then it forwards the packet to other intermediate nodes 2 and 5; the intermediate nodes 2 and 5 do the same and forward the packet to the destination node 4; QOS parameter is preferably based upon available bandwidth, error rate, and/or delay, etc.; therefore, 1-3-5-4 route can be least-cost path); and

receiving, at the first router, a second data packet that indicates a path taken by the first data packet to the destination (see paragraphs 44, 45, 69, and 70, once the intermediate node 3 receives the QOS route request from the source node 1, it determines whether the intermediate node 3 can support the requested QOS parameter and whether the packet has visited any router in the path other than the intermediate node 3, wherein the QOS link metric indicates whether the packet has visited any other router by determining whether the QOS link metric has been updated, then it forwards the packet to other intermediate nodes 2 and 5; the intermediate nodes 2 and 5 do the same and forward the packet to the destination node 4; QOS parameter is preferably based upon available bandwidth, error rate, and/or delay, etc.; therefore, 1-2-4 route can be least-delay path);

wherein the least-cost path differs from the first least-delay path (see Fig 1 and paragraph 45, 1-2-4 and 1-3-5-4 are two different paths);

regarding claim 8, further comprising:

receiving, at the second router, the first data packet (see paragraphs 67-70, a source node broadcasts the QOS route request to the destination node);

determining whether a second least-delay path from the second router to the destination satisfies a delay requirement indicated by the first data packet (see paragraphs 68, the source node broadcasts, which means all the paths are being determined whether the paths satisfy the delay requirement requested by the source node);

if the second least-delay path does not satisfy the delay requirement, then performing steps comprising:

updating the first data packet to indicate a wrong way (see paragraph 73, the updating is done by discarding the QOS route request and generate a route error to send back to the source node to notify that there is a link failure along the path); and

sending the first data packet to the first router (see paragraphs 67 and 73, if the requested QOS requirement cannot be satisfied, a route error packet is generated and return to the source node);

regarding claim 9, further comprising:

receiving at the first router, the first data packet (see paragraphs 67 and 73, the route error packet is returned to the source node via the reverse path through intermediate nodes);

determining whether the first data packet indicates a wrong way (see paragraph 73, the route error packet indicates a wrong way);

if the first data packet indicates a wrong way, then performing the steps comprising:

updating the first data packet to not indicate a wrong way (see paragraphs 67, 68, and 73, the source node broadcast a new QOS route request packet to the destination node, which does not indicate a wrong way); and

sending the first data packet to the third router (see paragraphs 67, 68, and 73, the source node broadcasts a new QOS route request packet to all the intermediate nodes connected to the source node including the intermediate node 3).

Allowable Subject Matter

5. Claim 6 is allowed.

Response to Arguments

6. Applicant's arguments filed 8/31/2007 have been fully considered but they are not persuasive.

7. In response to page 4 of the remarks, the applicants submit that, in Cain, an intermediate node does not determine a least-delay path from the non-source node to the destination. The examiner respectfully disagrees. The limitation in claim 1 merely

recites "determining whether a least-delay path from the first router to the destination satisfies the QoS requirement." There is no indication of whether an intermediate node or a source node does the determining step. However, even if the limitation in the claim recites that an intermediate node determines a least-delay path from the non-source node to the destination, Cain still reads on the limitation. Cain et al. disclose that each intermediate node determines whether the node can support the requested QoS parameter of the QoS route request RREQQ. If the intermediate node cannot support the QoS parameter of a particular request, then the request is denied of simply not forwarded by the node. If the node can support the QoS parameter of a particular request, then the node updates the QoS link metric and forwards the QoS route request to other intermediate node (see paragraphs 44-45). Therefore, the intermediate nodes determine a least-delay path by determining whether the node can support the requested QoS parameter and denied or forward the QoS route request based on the determination. If the QoS route request is forwarded to the destination, a least-delay path is determined.

8. In response to page 4 of the remarks, the applicants submit that the source node of Cain cannot correspond to the first router of claim 1. However, the Office Action analogizes an intermediate node to the first router, as submitted by the applicants on page 4 lines 2-3 of the remarks. Cain et al. disclose that the destination node generates a reply RREPQ upon receiving the QoS route request, wherein the destination node may have received the forwarded route request RREQQ from any of various possible routes, and a reply RREPQ is generated in each case (see paragraph 45). The reply

RREPQ is sent back to the source node via intermediate nodes along the various possible routes. Therefore, the intermediate node receives the reply RREPQ from the destination before it forwards the reply RREPQ to the source node.

Thus, in view of the above reasoning, the examiner believes that the 102(e) rejections should be sustained.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Examiner's Note: Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully

consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pao Sinkantarakorn whose telephone number is 571-270-1424. The examiner can normally be reached on Monday-Thursday 9:00am-3:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on 571-272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

PS

RICKY Q. NGO
SUPERVISORY PATENT EXAMINER